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(54) **SEARCHING ELECTRONIC PROGRAM GUIDE DATA**

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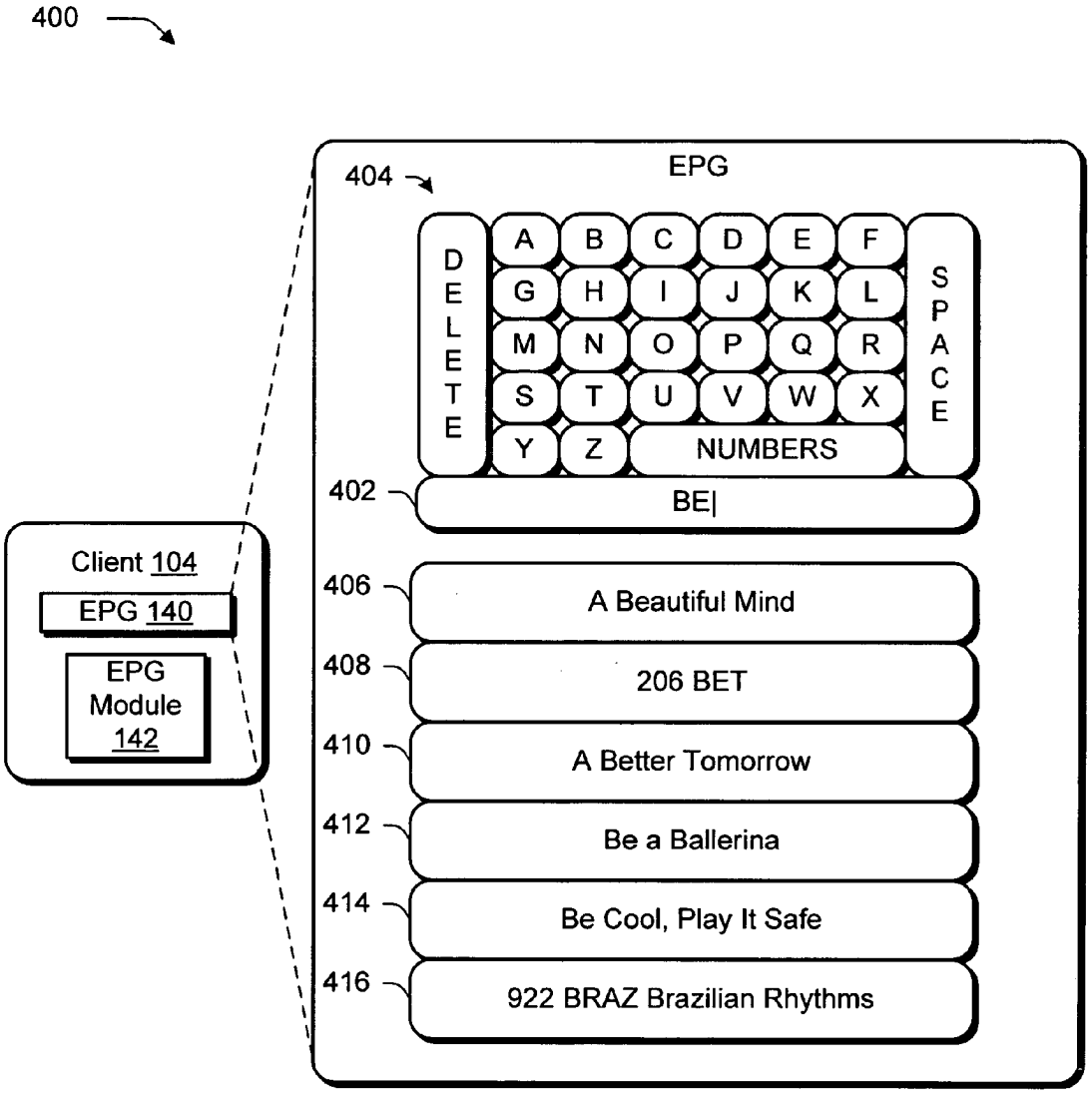
(57) **ABSTRACT**

Searching electronic program guide (EPG) data is described. The EPG data may be compartmentalized into channel metadata that describes characteristics of one or more channels and content metadata that describes characteristics of one or more content items. In a implementation, a method includes searching channel metadata and content metadata. A result of the searching is formed for output in conjunction with an electronic program guide (EPG).



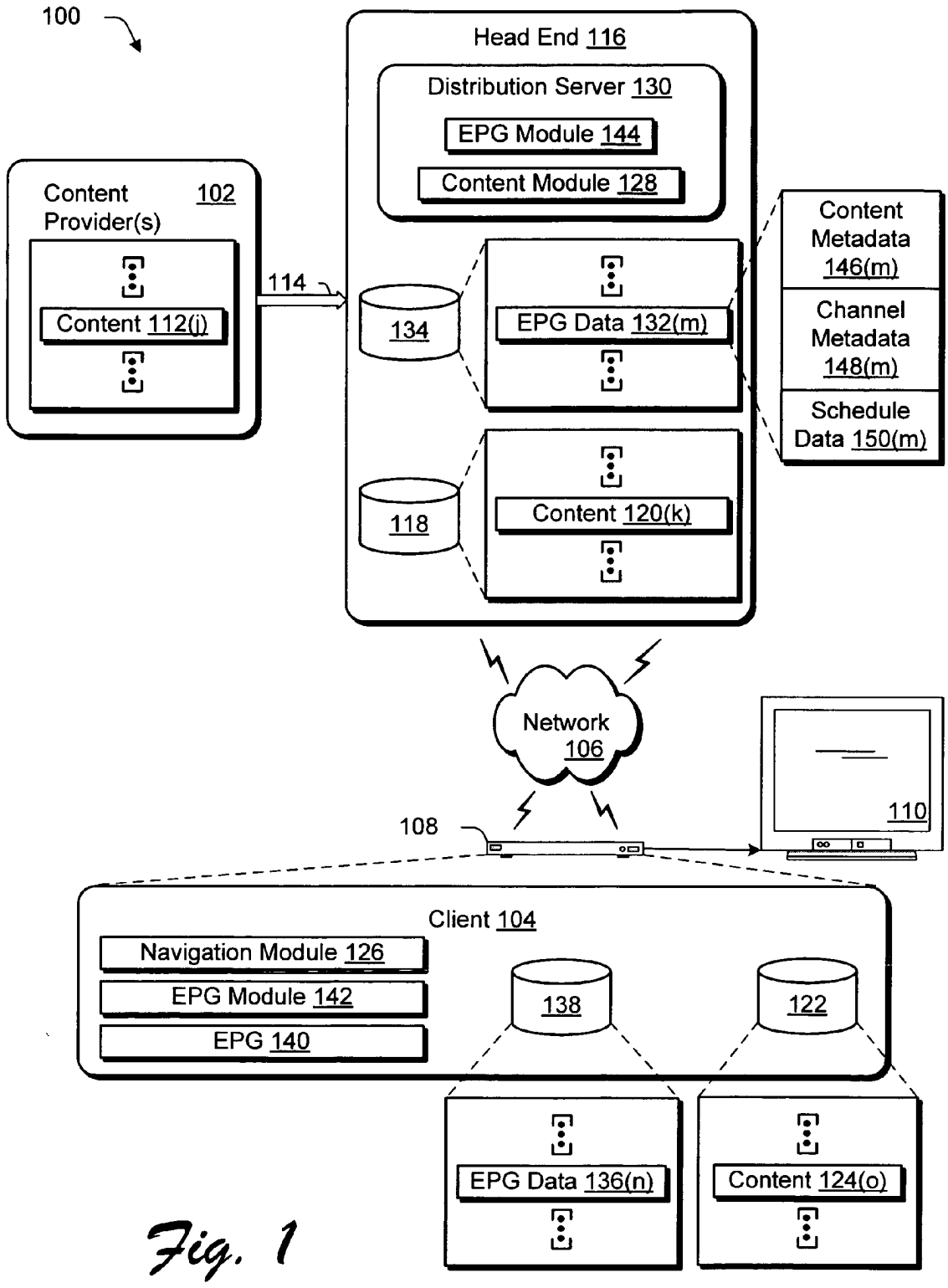

100
Head End 116
Distribution Server 130
EPG Module 144
Content Module 128
Content Provider(s) 102
Content 112(j)
114
134
EPG Data 132(m)
Content Metadata 146(m)
Channel Metadata 148(m)
Schedule Data 150(m)
118
Content 120(k)
Network 106
108
110
Client 104
Navigation Module 126
EPG Module 142
EPG 140
138
122
EPG Data 136(n)
Content 124(o)

Fig. 1

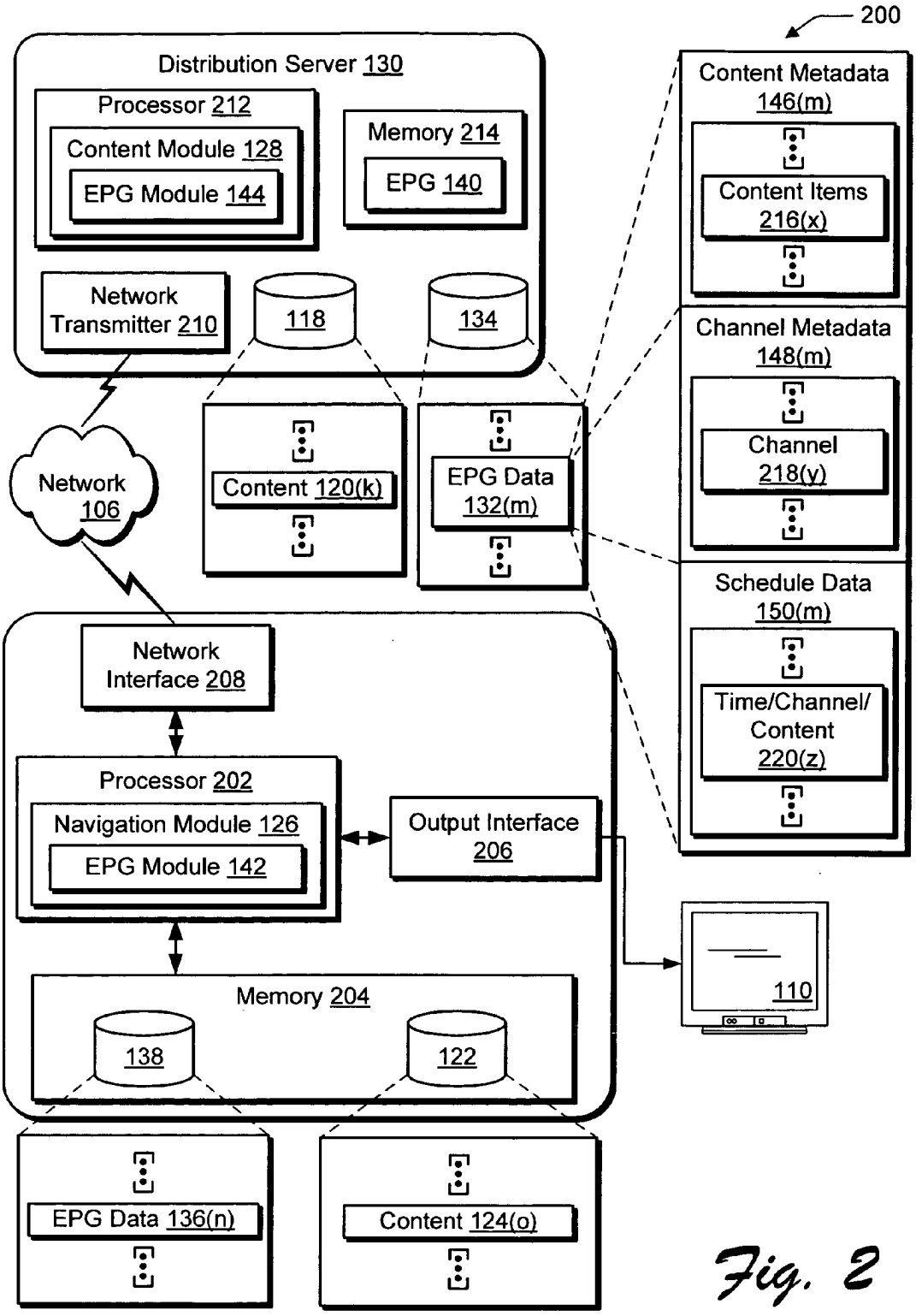

200
Distribution Server 130
Processor 212
Content Module 128
EPG Module 144
Memory 214
EPG 140
Network Transmitter 210
118
134
Network 106
Content 120(k)
EPG Data 132(m)
Content Metadata 146(m)
Content Items 216(x)
Channel Metadata 148(m)
Channel 218(y)
Schedule Data 150(m)
Time/Channel/ Content 220(z)
Network Interface 208
Processor 202
Navigation Module 126
EPG Module 142
Output Interface 206
110
Memory 204
138
122
EPG Data 136(n)
Content 124(o)

Fig. 2

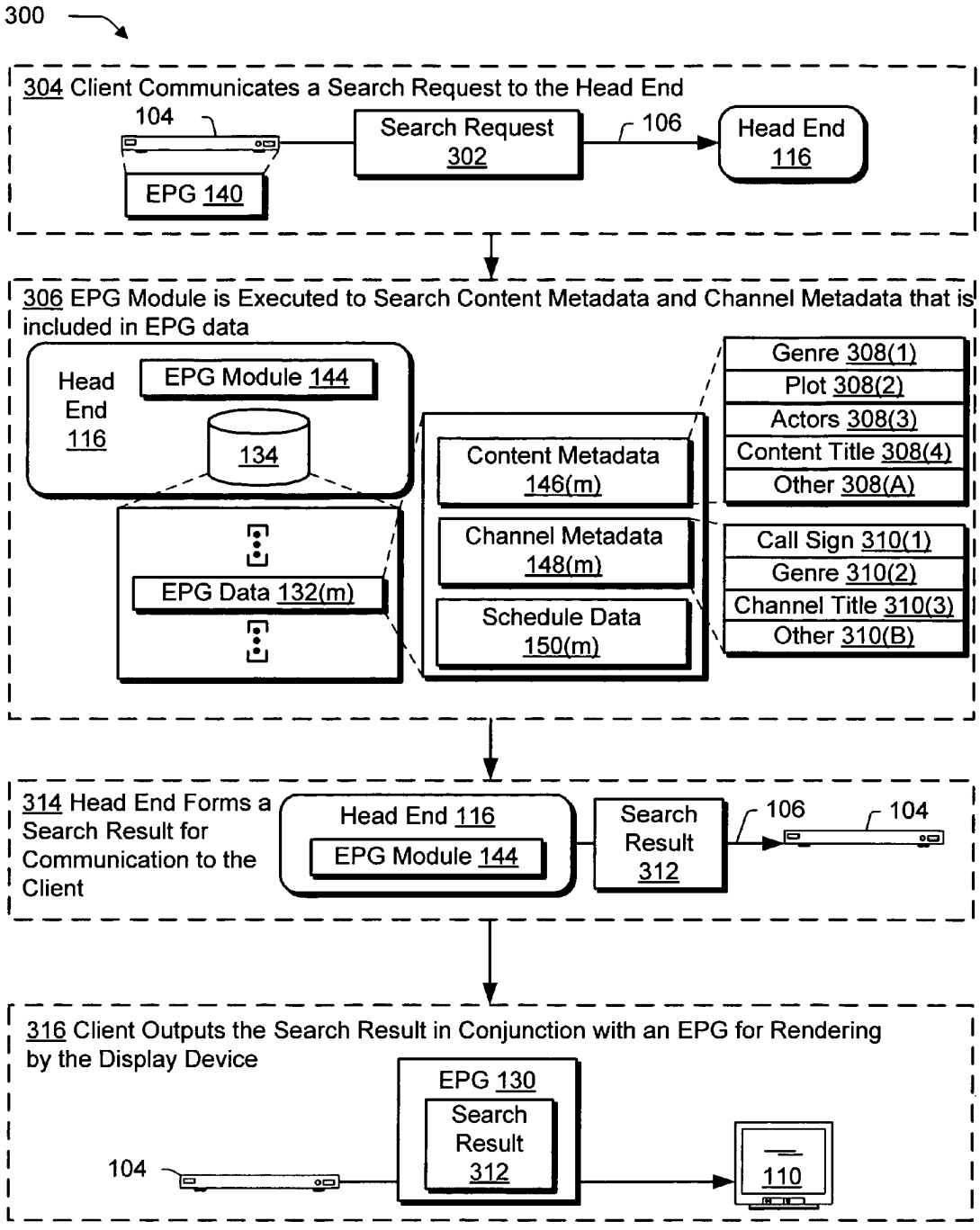

300
304 Client Communicates a Search Request to the Head End
104
EPG 140
Search Request 302
106
Head End 116
306 EPG Module is Executed to Search Content Metadata and Channel Metadata that is included in EPG data
Head End 116
EPG Module 144
134
EPG Data 132(m)
Content Metadata 146(m)
Channel Metadata 148(m)
Schedule Data 150(m)
Genre 308(1)
Plot 308(2)
Actors 308(3)
Content Title 308(4)
Other 308(A)
Call Sign 310(1)
Genre 310(2)
Channel Title 310(3)
Other 310(B)
314 Head End Forms a Search Result for Communication to the Client
Head End 116
EPG Module 144
Search Result 312
106
104
316 Client Outputs the Search Result in Conjunction with an EPG for Rendering by the Display Device
EPG 130
Search Result 312
104
110

Fig. 3

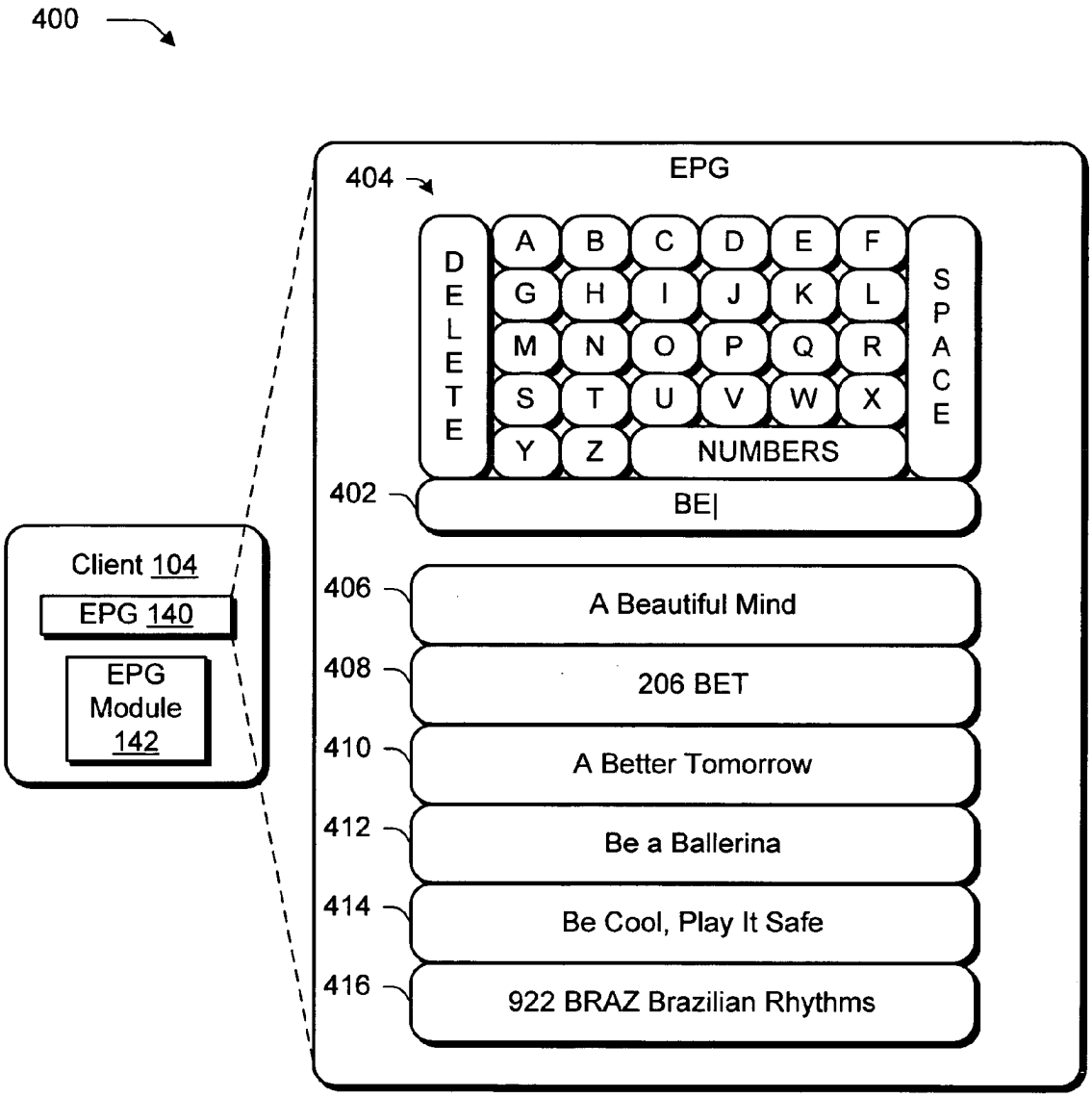

400
404
EPG
DELETE
A B C D E F
G H I J K L
M N O P Q R
S T U V W X
Y Z NUMBERS
SPACE
402
BE|
Client 104
EPG 140
EPG Module 142
406
A Beautiful Mind
408
206 BET
410
A Better Tomorrow
412
Be a Ballerina
414
Be Cool, Play It Safe
416
922 BRAZ Brazilian Rhythms

Fig. 4

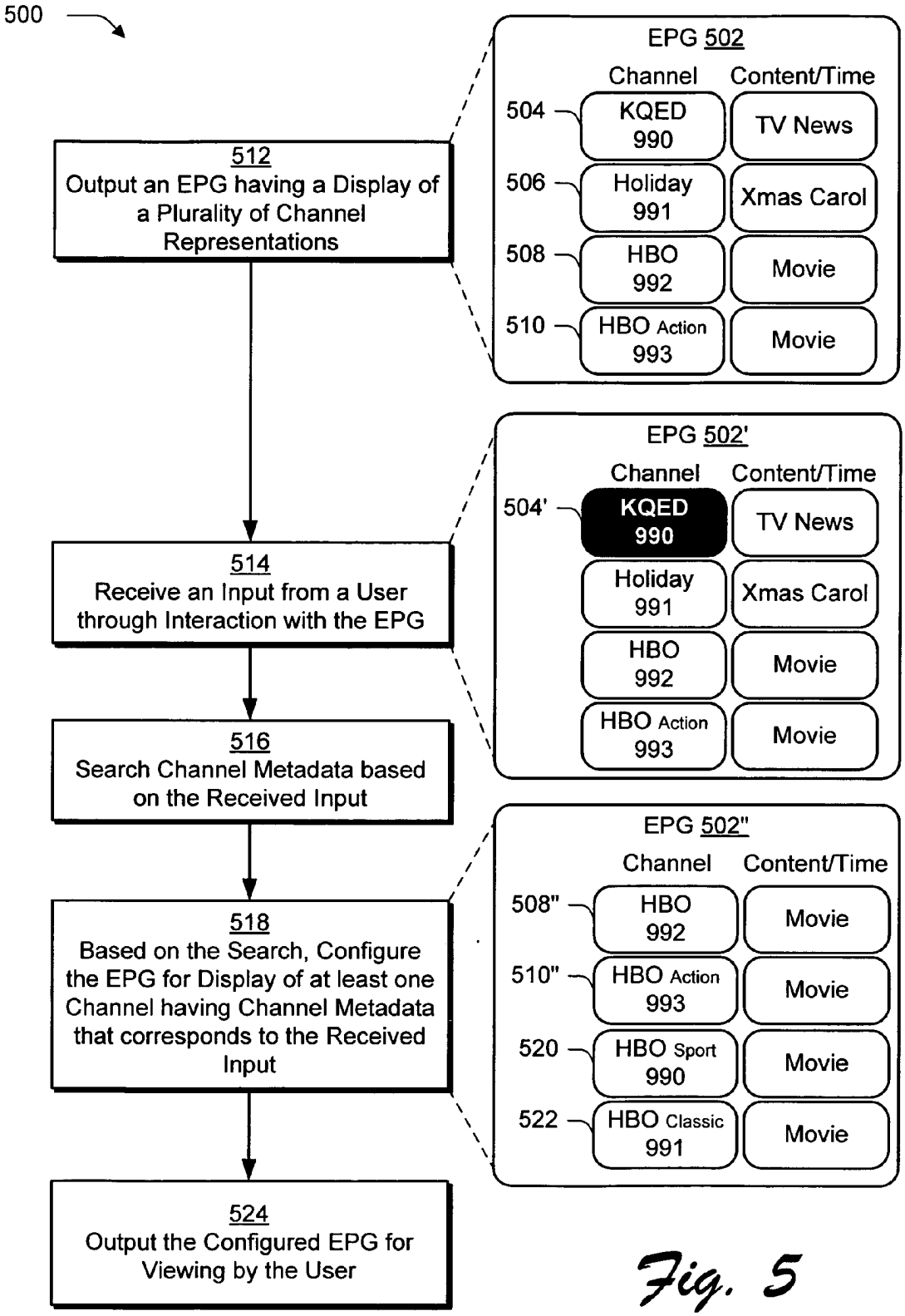

500
512
Output an EPG having a Display of a Plurality of Channel Representations
514
Receive an Input from a User through Interaction with the EPG
516
Search Channel Metadata based on the Received Input
518
Based on the Search, Configure the EPG for Display of at least one Channel having Channel Metadata that corresponds to the Received Input
524
Output the Configured EPG for Viewing by the User
EPG 502
Channel
Content/Time
504
KQED 990
TV News
506
Holiday 991
Xmas Carol
508
HBO 992
Movie
510
HBO Action 993
Movie
EPG 502'
Channel
Content/Time
504'
KQED 990
TV News
Holiday 991
Xmas Carol
HBO 992
Movie
HBO Action 993
Movie
EPG 502"
Channel
Content/Time
508"
HBO 992
Movie
510"
HBO Action 993
Movie
520
HBO Sport 990
Movie
522
HBO Classic 991
Movie

Fig. 5

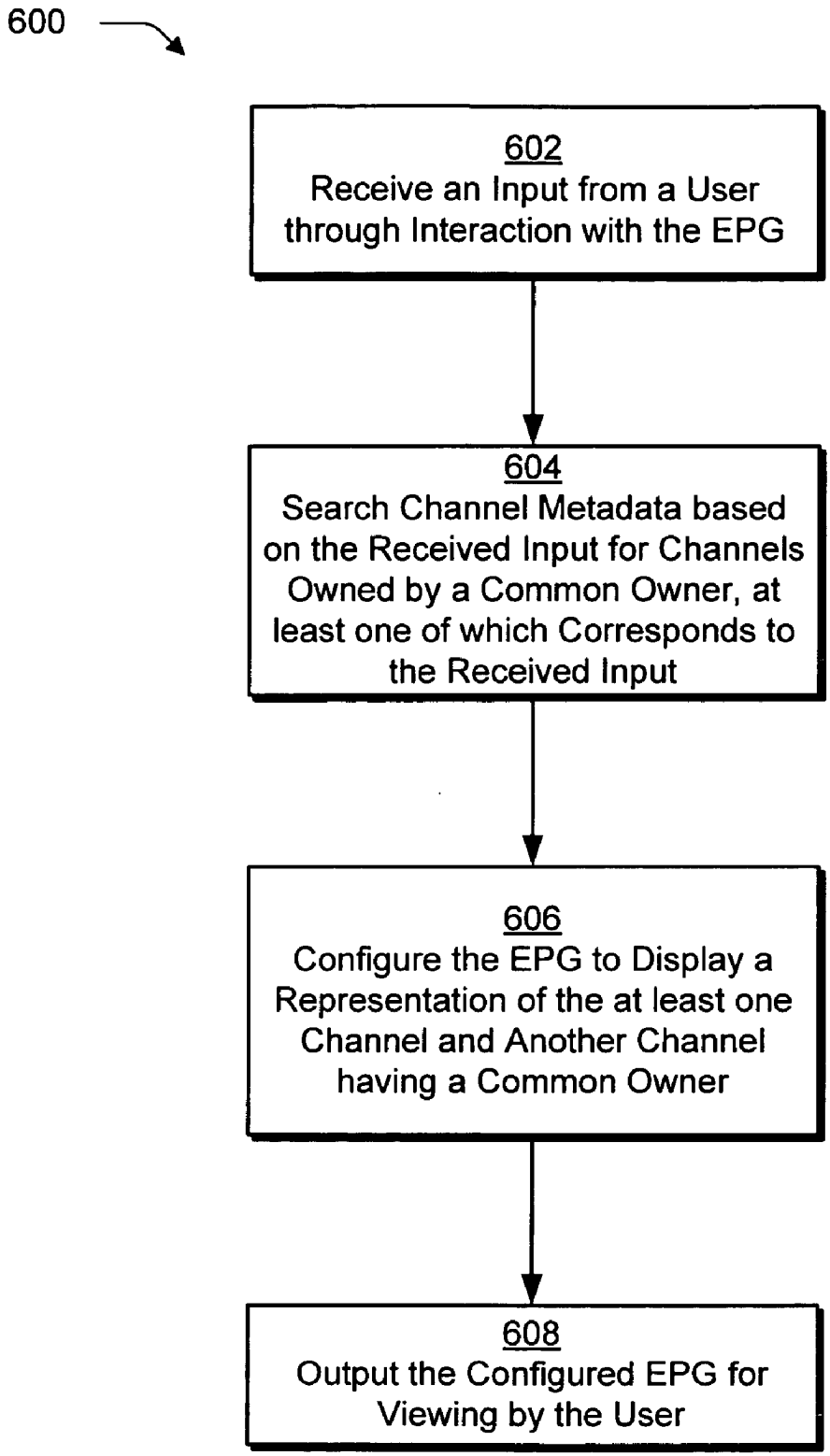

600
602
Receive an Input from a User through Interaction with the EPG
604
Search Channel Metadata based on the Received Input for Channels Owned by a Common Owner, at least one of which Corresponds to the Received Input
606
Configure the EPG to Display a Representation of the at least one Channel and Another Channel having a Common Owner
608
Output the Configured EPG for Viewing by the User

Fig. 6

SEARCHING ELECTRONIC PROGRAM GUIDE DATA

TECHNICAL FIELD

[0001] The present invention generally relates to the field of content navigation and more particularly relates to searching electronic program guide data.

BACKGROUND

[0002] Users have access to an ever increasing variety of content that may be output in a wide variety of ways. For example, a user may view traditional television programming received over a network by using a client, such as a set-top box. The user may also view pay-per-view movies, order video-on-demand (VOD) content, interact with a video game, play music, and so on. The user may also access content locally on the client, such as from a digital video disc (DVD), broadcast content stored on a hard disk drive for viewing in the future (e.g., a digital video recorder), and so on.

[0003] To navigate through this even increasing variety of content, the user may interact with user interface which displays representations of the content, such as an electronic program guide (EPG). For example, the EPG may enable the user to observe a listing of television programs that are currently being streamed, as well as a listing of television programs that will be streamed in the future. Additionally, the EPG may allow the user to navigate to a television program from the EPG itself. For instance, the user may select a representation of a television program to cause the client to tune to that television program.

[0004] Traditionally, an EPG is configured to locate particular content items of interest, such as a particular television program. However, content may also be known by the name of the provider instead of by the name of the content itself. For instance, a user may want to watch the "Weather Channel" and not know the name of any particular content item that is available via the Weather Channel. A traditional EPG, however, does not address the channels themselves and rather is focused on the content items that are available via the channels.

[0005] Therefore, there is a continuing need for searching of electronic program guide (EPG) data that addresses channels and channel characteristics.

SUMMARY

[0006] Searching EPG data is described. In an implementation, EPG data includes content metadata that describes characteristics of a respective one of a plurality of content items, such as content title, actors, genre, and so on. EPG data also includes channel metadata that describes characteristics respective channels, such as call sign, channel name, and so on. A search may be performed on both the content and channel metadata to locate content items and channels, respectively, which correspond to a search request. Thus, in this example, a single search may be performed to locate both channels and content items. In another example, the search may be performed to locate a particular channel without also searching for corresponding content items.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] **FIG. 1** is an illustration of an environment in an exemplary implementation that includes a content provider that is communicatively coupled to a client over a network.

[0008] **FIG. 2** is an illustration of an exemplary implementation of a system showing a distribution server and the client of **FIG. 1** in greater detail.

[0009] **FIG. 3** is a flow diagram depicting a procedure in an exemplary implementation in which both content metadata and channel metadata, which collectively provide EPG data, are searched in response to a search request received from a user through interaction with an EPG.

[0010] **FIG. 4** is an illustration of an exemplary implementation in which the client of **FIG. 3** outputs the EPG, which includes a search window configured for interaction by a user to form the search request.

[0011] **FIG. 5** is a flow diagram depicting a procedure in another exemplary implementation in which a search request and a search result are formed through interaction by a user with an EPG.

[0012] **FIG. 6** is a flow diagram depicting a procedure in an exemplary implementation in which a result of a search of EPG data includes channels having a common owner.

[0013] The same reference numbers are utilized in instances in the discussion to reference like structures and components.

DETAILED DESCRIPTION

[0014] Overview

[0015] Searching electronic program guide (EPG) data is described. In an implementation, functionality is provided to search for channels as well as content items that are available via the channels. For example, a user may enter a search request having the alphabetic characters "STA". EPG data may be configured to include content metadata that describes characteristics of content items (e.g., title, detailed description, and so on) and channel metadata that describes characteristics of channels (e.g., call sign, channel name, and so on). Both the content metadata and the channel metadata are searched in response to the request. For instance, the search "STA" may locate a "Star Gazing" channel and a television program titled "Stars of Hollywood". In this way, the user is provided with a single, integrated search of the EPG data that addresses both channels and content items. Further discussion of EPG data searching may be found beginning in relation to **FIG. 1**.

[0016] The search request may be entered in a variety of ways. For example, an EPG may be provided which includes representations of a plurality of content items (e.g., television programs) and a search window. The user may utilize an input device (e.g., a remote control) to enter text into the search window to search the EPG data. In another example, the user may highlight a channel identifier in the EPG and then enter text via the input device. As the user enters the text, the EPG may be configured to automatically scroll to the channel that matches the entered text. Further discussion of entering a search request may be found in relation to **FIGS. 4 and 5**.

[0017] Exemplary Environment

[0018] **FIG. 1** is an illustration of an environment **100** in an exemplary implementation that includes a content provider **102** that is communicatively coupled to a client **104** over a network **106**. The client **104** may be configured in a

variety of ways. For example, the client **104** may be configured as a computing device that is capable of communicating over the network **106**, such as a desktop computer, a mobile station, an entertainment appliance, a set-top box **108** communicatively coupled to a display device **110** as illustrated, a wireless phone, and so forth. The client **104** may range from a full resource device with substantial memory and processor resources (e.g., television enabled personal computers, television recorders equipped with hard disk) to a low-resource device with limited memory and/or processing resources (e.g., traditional set-top boxes). The client **104** may also relate to a person and/or entity that operates the client. In other words, client **104** may describe a logical client that includes a user and/or a machine. Although one client **104** is illustrated, a plurality of clients may be communicatively coupled to the network **106**. Likewise, although one content provider **102** is illustrated, a plurality of content providers may also be included in the environment **100**. The network **106** is illustrated as the Internet, and may include a variety of other networks, such as an intranet, a wired or wireless telephone network, a broadcast network which may include a backchannel to provide two-way communication, and so forth.

[**0019**] The content provider **102** includes a plurality of content **1120**), where "j" can be any integer from 1 to "J". The content **1120**) may include a variety of data, such as streaming content (e.g., television programming and pay-per-view movies), one or more results of remote application processing, and so on. The content **112**(*j*) is communicated over a network **114** to a head end **116**. The network **114** may be the same as or different from network **106**. For example, the network **114** may be configured as a private subnet while the network **106** is configured as the Internet.

[**0020**] Content **1120**) communicated from the content provider **102** over the network **114** is received by the head end **116** and stored in a content database **118** as content **120**(*k*), where "k" can be any integer from "1" to "K". The content **120**(*k*) may be the same as or different from the content **1120**) received from the content provider **102**. The content **120**(*k*), for instance, may include additional data for streaming to the client **104**, may be compressed using one or more data compression techniques by the head end **116**, may be encrypted, and so forth.

[**0021**] The client **104** may be configured in a variety of ways to receive the content **120**(*k*) over the network **106**. As illustrated, the client **104** may be configured as a set-top box **108** that is communicatively coupled to a display device **110**. The client **104** includes hardware and software to transport and decrypt content **120**(*k*) received from the head end **116** for rendering by the display device **110**. Although a display device **110** is shown, a variety of other output devices are also contemplated, such as speakers.

[**0022**] The client **104** may also include digital video recorder (DVR) functionality. For instance, the client **104** may include a database **122** to record the content **120**(*k*) received from the network **106**. The database **122** may be implemented in a variety of ways, such as a hard disk drive, a removable computer-readable medium (e.g., a writable digital video disc), and so on. Content **124**(*o*), where "o" can be any number from one to "O", that is stored in the database **122** of the client **104** may be copies of the content **120**(*k*) that was streamed from the head end **116**. Additionally, content **124**(*o*) may represent content obtained from a variety of other sources, such as from a computer-readable medium (e.g., a digital video disc) that is accessible by the client **104**.

[**0023**] The client **104** includes a navigation module **126** that is executable on the client **104** to control content playback on the client **104**, such as through the use of one or more "trick modes". The trick modes may provide non-linear playback of the content **124**(*o*) (i.e., time shift the playback of the content **124**(*o*)) such as pause, rewind, fast forward, slow motion playback, and the like. For example, during a pause, the client **104** may continue to record the content **120**(*k*) in the database **122** as content **124**(*o*). The client **104**, through execution of the navigation module **126**, may then playback the content **124**(*o*) from the database **122**, starting at the point in time the content **124**(*o*) was paused, while continuing to record the currently-broadcast content **120**(*k*) in the database **122** from the head end **116**.

[**0024**] When playback of the content **124**(*o*) is requested, the navigation module **126** may be executed on the client **104** to retrieve the content **124**(*o*). The navigation module **126** may also restore the content **124**(*o*) to the original encoded format as received from the content provider **102**. For example, when the content **120**(*k*) is recorded in the database **122** to form content **124**(*o*), the content **120**(*k*) may be compressed. Therefore, when the navigation module **126** retrieves the content **124**(*o*), the content **124**(*o*) is decompressed for rendering by the display device **110**.

[**0025**] The navigation module **126** may also be executed on the client **104** to retrieve content **120**(*k*) stored on the head end **116**. For example, the navigation module **126** may communicate with a content module **128** that is executable on a distribution server **130** to cause recordation of content **112**(*j*) received from the content provider **102** as content **120**(*k*). In this instance, the content module **128** provides network digital video recorder (NDVR) functionality in a manner similar to a DVR. For instance, the content module **128** may support one or more trick modes to fast forward, pause, perform slow-motion playback, and so on in a manner similar to playback of the content **124**(*o*) that is stored locally on the client **104**. The navigation module **126** may also communicate with the content module **128** to order on-demand content (e.g., VOD), PPV content, and so on. Thus, the environment **100** may support a wide variety of content, such as VOD, PPV, locally-stored content **124**(*o*), remotely-stored content **120**(*k*), television programs, video games, music, and so on.

[**0026**] To navigate through this wide variety of content to locate a particular content item of interest (e.g., locally on the client **104**, remotely from the head end **116**, and so on), the environment **100** may support electronic program guide (EPG) functionality. For instance, the head end **116** may also include a plurality of EPG data **132**(*m*), where "m" can be any integer from one to "M". The plurality of EPG data **132**(*m*) is stored in an EPG database **134** for communication to the client **104**. Although illustrated separately, the EPG database **134** and the content database **118** may be implemented utilizing the same system. In an implementation, the EPG data **132**(*m*) is broadcast utilizing a carousel file system. The carousel file system repeatedly broadcasts the EPG data **132**(*m*) over an out-of-band (OOB) channel to the client **104** over the network **106**. The client **104** may then store the broadcast EPG data **132**(*m*) received over the

network **106** as EPG data **136**(*n*), where "n" can be any integer from one to "N", in a database **138**. To generate an EPG **140**, the client **104** executes an EPG module **142** that examines and configures the EPG data **136**(*n*) into a form that suitable for output to and rendering by the display device **110**. Additionally, the EPG **140** may be configured to describe content that is provided from various locations, such as the content **120**(*k*) available from the head end **116**, content **124**(*o*) stored locally on the client **104**, and so on.

[**0027**] In another implementation, the EPG **140** is formed from the EPG data **132**(*m*) at the head end **116** and then distributed to the client **104**. For example, the head end **116** may also include an EPG module **144** that is executable on the distribution server **130** to generate the EPG **140** from the EPG data **132**(*m*). The EPG **140** may be configured in a variety of ways through execution of the EPG module **144** at the head end **116**, such as a particular EPG for each particular client that is communicatively coupled to the head end **116**, a generic EPG representing each item of content **120**(*k*) (which will also be referred to in the following discussion as a "content item"), and so on. Distribution from the head end **116** to the client **104** may be accommodated in a number of ways, including cable, RF, microwave, digital subscriber line (DSL), and satellite.

[**0028**] Either one or both of the EPG modules **142**, **144** may be executed to search EPG data **136**(*n*), **132**(*m*) to locate a particular content item and/or channel of interest. For example, the EPG data **132**(*m*) may include content metadata **146**(*m*), channel metadata **148**(*m*), and schedule data **150**(*m*). Content metadata **146**(*m*) is configured to describe one or more characteristics of a corresponding content item. Likewise, channel metadata **148**(*m*) is configured to describe one or more characteristics of a corresponding channel. Channels may be configured in a variety of ways, and include what is also referred to as "sub-channels", which may be utilized to provide alternate-audio version of content, wide-screen versions of content items, and so on.

[**0029**] Schedule data **150**(*m*) is utilized to describe when the content items described in the content metadata **146**(*m*) are available via the channels described via the channel metadata **148**(*m*). The EPG module **144**, when executed may search the content metadata **146**(*m*) as well as the channel metadata **148**(*m*) to locate content and channels, respectively, that correspond to a search request. Further discussion of EPG data may be found in relation to **FIG. 2**, while further discussion of execution of the EPG modules may be found in relation to **FIG. 3**.

[**0030**] Generally, any of the functions described herein can be implemented using software, firmware (e.g., fixed logic circuitry), manual processing, or a combination of these implementations. The terms "module,""functionality," and "logic" as used herein generally represent software, firmware, or a combination of software and firmware. In the case of a software implementation, the module, functionality, or logic represents program code that performs specified tasks when executed on a processor (e.g., CPU or CPUs). The program code can be stored in one or more computer readable memory devices, further description of which may be found in relation to **FIG. 2**. The features of the searching strategies described below are platform-independent, meaning that the searching strategies may be implemented on a variety of commercial computing platforms having a variety of processors.

[**0031**] **FIG. 2** is an illustration of an exemplary implementation of a system **200** showing the distribution server **130** and the client **104** of **FIG. 1** in greater detail. The client **104** includes a processor **202** and memory **204**. The navigation module **126** is illustrated as being executed on the processor **202** and is storable in memory **204**. The database **122**, which is utilized to store the plurality of content **124**(*o*), is illustrated as included in the memory **204**. Likewise, the database **138** which is used to store the plurality of EPG data **136**(*n*) is also illustrated as included in the memory **204**. Although illustrated together, the databases **122**, **138** may be implemented as stand-alone devices. For example, the databases **122**, **138** may be respectively implemented as a hard disk drive and RAM, both may be configured as RAM, one may be configured as a removable memory device, and so forth.

[**0032**] As shown in the environment **100** of **FIG. 1**, the client **104** may obtain content from a variety of sources. For example, the client **104** may execute the navigation module **126** to retrieve content **124**(*o*) from the database **122**. The retrieved content **124**(*o*) may then be output using an output interface **206** for rendering on the display device **110**. The client **104**, through execution of the navigation module **126**, is also capable of requesting content **120**(*k*) from the distribution server **130** over the network **106**. The distribution server **130** is represented pictorially as including the database **118** having the plurality of content **120**(*k*) for streaming over a network **106**. The distribution server **130** may provide EPG data **132**(*m*) from the database **134** that describes content available from the content provider **102** of **FIG. 1**.

[**0033**] The navigation module **126**, when executed on the processor **202**, may send a request via the network **106** to the distribution server **130** to request content **120**(*k*) for streaming over the network **106**, such as a PPV movie, VOD, and so forth. To communicate using the network **106**, the client **104** includes a network interface **208** to communicatively couple the client **104** with the distribution server **130**. As previously described, the network **106** may support two-way communication between the distribution server **130** and the client **104**. Additionally, the network **106** can be any type of network, using any type of network topology and any network communication protocol, and can be represented or otherwise implemented as a combination of two or more networks including, for example, microwave, satellite, and/or data networks, such as the Internet. Furthermore, the network **106** may be capable of transmitting and receiving wired or wireless media using any broadcast format or broadcast protocol.

[**0034**] The distribution server **130** is illustrated as including a network transmitter **210** (hereinafter "transmitter"). The transmitter **210** may distribute the content **120**(*k*) from the database **118**, the EPG data **132**(*m*) from the database **134**, and so on. In alternate implementations, the distribution server **130**, database **118**, database **134**, and the transmitter **210** may be implemented as one or more distinct components, locally as part of the head end **116** and/or content provider **102** of **FIG. 1**, or remotely as part of another distinct system. For instance, although the distribution server **130** is shown as including the EPG module **144** and content module **128** (which are executable for distribution of content **120**(*k*), distribution of the EPG data **132**(*m*), and/or generation of the EPG **140** as previously described), each component and its corresponding functionality may be

implemented via a distinct device, such as a server. Accordingly, the distribution server **130** may represent a plurality of servers which provide the functionality.

[**0035**] The distribution server **130** also includes a processor **212** and memory **214**. The content module **128** is illustrated as including the EPG module **144**, which are both illustrated as being executed on the processor **212** and are storable in memory **214**. The EPG module **144** is illustrated as within the content module **128** to portray that both modules may be implemented together, although both modules may also be implemented separately as "stand-alone" modules as shown in **FIG. 1**.

[**0036**] The content module **128** may also control distribution of the content **120**(*k*) over the network **106** as previously described. For instance, the content module **128** may receive a request from the client **104** to receive the content **120**(*k*). The content module **128** processes the request, such as to determine whether the client **104** is permitted to receive the content **120**(*k*) (e.g., the client **104** has obtained conditional access rights to the content), obtain billing information from the client **104**, locate the requested content from the plurality of content **120**(*k*), and so on. If the client **104** is permitted to receive the content **120**(*k*), the content module **128** may be executed to stream the content **120**(*k*) to the client **104** over the network **106** by using the transmitter **210**. In this instance, the content **120**(*k*) is provided from the distribution server **130** in response to the request, and therefore is provided "on-demand" to the client **104**. Examples of on-demand content items include VOD, video games, content that is locally stored via a DVR or remotely via a NDVR, and so on.

[**0037**] The content module **128**, when executed in this example, may also control distribution of the EPG data **132**(*m*) from the database **134** over the network **106**. EPG data **132**(*m*) may include any data that may be utilized to generate the EPG **140**, such as obtained from the content provider **102** which describes the provided content, metadata included with content **124**(*o*) stored on the database **138** on the client **104** as previously described in the DVR example, and so on.

[**0038**] The EPG data **132**(*m*), for instance, may be configured to include content metadata **146**(*m*), channel metadata **148**(*m*), and schedule data **150**(*m*) as previously described. Content metadata **146**(*m*) includes data that describes characteristics of a particular one of a plurality of content items **216**(*x*), where "x" can be any integer from one to "X". For example, content metadata **146**(*m*) for content item **216**(*x*) may include a content title, detailed description of the content item, content genre, actors appearing in the content item, rating (e.g., PG, G, Mature, and so on), plot, whether the content item supports closed captioning, whether the content item is interactive, and other descriptive information that corresponds to the content item itself. Channel metadata **148**(*m*) includes data that describes characteristics of a particular one of a plurality of channels **218**(*y*), where "y" can be any integer from one to "Y". For example, channel metadata **148**(*m*) may describe a call sign (e.g., KXYZ) of the respective channel **218**(*y*), a title (e.g., "The Fried Food Channel") of the respective channel **218**(*y*), a genre (e.g., sports, news, and so on), a detailed description of the respective channel **218**(*y*), the owner of the respective channel **218**(*y*), and so on.

[**0039**] Schedule data **150**(*m*) includes a plurality of time/content/channel **220**(*z*) entries, where "z" can be any integer from one to "Z". Each of the time/content/channel **220**(*z*) entries describes a particular time, at which, a corresponding one of the plurality of content items **216**(*x*) is available via a corresponding one of the plurality of channels **218**(*y*). Thus, the schedule data **150**(*m*) may be utilized to "link" the content metadata **146**(*m*) with the channel metadata **148**(*m*) for generating the EPG **140**.

[**0040**] The EPG module **144**, when executed, utilizes the EPG data **132**(*m*), and more particularly the content metadata **146**(*m*), channel metadata **148**(*m*), and schedule data **150**(*m*) to generate the EPG **140**. Once displayed, a user may interact with the EPG **140** to search the EPG data **132**(*m*) for particular content items **216**(*x*) and/or channels **218**(*y*) of interest, further discussion of which may be found beginning in relation to **FIG. 3**.

[**0041**] Exemplary Procedures

[**0042**] The following discussion describes searching of EPG data that may be implemented utilizing the previously described systems and devices. Aspects of each of the procedures may be implemented in hardware, firmware, or software, or a combination thereof. The procedures are shown as a set of blocks that specify operations performed by one or more devices and are not necessarily limited to the orders shown for performing the operations by the respective blocks.

[**0043**] **FIG. 3** is a flow diagram depicting a procedure **300** in an exemplary implementation in which both content metadata **146**(*m*) and channel metadata **148**(*m*) are searched in response to a search request received from a user through interaction with an EPG. In this implementation, searching will be described that is performed through execution of the EPG module **144** on the distribution server **130**. It should be noted that similar searching may also be performed locally on the client, such as through execution of the EPG module **142** of **FIG. 1**.

[**0044**] First, a client **104** communicates a search request **302** to a head end **116** over a network **106** (block **304**). The search request **302** may be formed and communicated in a variety of ways. For example, the search request may be entered by the user through use of an input device, such as a keyboard, to formulate the search. In another implementation, the search request may be formed through interaction by the user with the EPG **140** when output by the client **104**, further discussion of which may be found in relation to **FIG. 4**.

[**0045**] The head end **116**, upon receipt of the search request **302**, executes the EPG module **144** to search EPG data **132**(*m*), and more particularly to search content metadata **146**(*m*) and channel metadata **148**(*m*) that is included in the EPG data **132**(*m*). For example, the head end **116** may include a database **134**, as previously described in relation to **FIG. 1**, which includes a plurality of EPG data **132**(*m*). The EPG data **132**(*m*) may include content metadata **146**(*m*), channel metadata **148**(*m*), and schedule data **150**(*m*), each of which is compartmentalized to be separate, one from another. For instance, the content metadata **146**(*m*) may be downloaded and stored on the head end **116** separately from the channel metadata **148**(*m*).

[**0046**] When searching the EPG data **132**(*m*), the EPG module **144** may compare the search request **302** to a

plurality of characteristics of the content metadata **146**(*m*) and/or the channel metadata **148**(*m*) to find a match. For instance, the content metadata **146**(*m*) may describe a genre **308**(**1**), plot **308**(**2**), actors **308**(**3**), content title **308**(**4**), and other **308**(A) characteristics of a particular content item. Likewise, the channel metadata **148**(*m*) may describe a plurality of characteristics of a particular channel, such as a call sign **310**(**1**), genre **310**(**2**), channel title **310**(**3**), and other **310**(B) such characteristics. The EPG module **144** may compare text, such as alphabetic characters, included in the search request **302** with text describing the characteristics **308**(**1**)-**308**(A), **310**(**1**)-**310**(B) of the content and channels, respectively, to find corresponding content and channels. In an implementation, the EPG module **144** may also determine when the described content items that correspond to the located content metadata **146**(*m*) are available by examining the schedule data **150**(*m*).

[**0047**] Based on the search, the head end **116** executes the EPG module **144** to form a search result **312** for communication to the client **104** over the network **106** (block **314**). For example, the EPG module **144** may be included within a server module that is configured to form and communicate a stream of packets over the network **106** to the client **104**. In the illustrated implementation, the client **104** then outputs the search result **312** in conjunction with an EPG **140** for rendering by the display device **110** (block **316**). For example, the search result **312** may include a plurality of representations of channels and content items that were located during the search. The plurality of representations may be configured to enable the user to navigate to the represented item, such as to tune to a represented channel, load a represented content item from the database **122** of **FIG. 1**, and so on. Thus, the search module **144** may be executed to search both content and channel metadata **146**(*m*), **148**(*m*) to locate channels and/or content items of interest. As previously described, the search request **302** may be formed in a variety of ways, an example of which may be found in relation to the following illustration.

[**0048**] **FIG. 4** is an illustration of an exemplary implementation in which the client of **FIG. 3** outputs the EPG **140**, which includes a search window **402** configured for interaction by a user to form the search request **302**. The EPG **400** of **FIG. 4** is configured for output in a "10' experience". For example, a desktop computer is generally used by a user while sitting close to a display device. The user may utilize a mouse and keyboard connected to the desktop computer to interact with one or more applications that are being executed on the desktop computer. Because of the proximity between the user and the display device, this is referred to as a "2' experience" (e.g., a distance of about two (2) feet). Clients may also be configured for use in a more casual setting, such as a set-top box in a living room. To interact with the set-top box, the user may utilize a remote control. Because of the distance between the user and the display device, this scenario is referred to as a "10' experience". Traditional EPGs that are configured for the 10' experience, however, generally require a separate search page to search the EPG data. Therefore, a user utilizing a traditional EPG is required to leave an EPG guide page, which includes representations of content items, to access a dedicated search page to perform the search. This navigation between pages results in inconvenience to the user and consequent underutilization of the search feature. Accordingly, the EPG **400** includes a search window **402** such that the user does not need to leave an EPG guide page to perform a search.

[**0049**] To enter text via the EPG **400**, for instance, a display of a keyboard **404** may be provided. For instance, a user may enter alphabetic text by selecting the representations of letters included in the keyboard **404**, an example of which is illustrated in **FIG. 4** as "BE". Alternatively, a mobile phone text entry system may be used to allow users to enter text quickly using the commonly used system employed by mobile devices.

[**0050**] Upon receipt of the alphabetic text "BE", the EPG module **144** may search EPG data having content and channel metadata (e.g., EPG data **132**(*m*) and/or EPG data **136**(*n*) of **FIG. 1**) to find content items and channels which correspond to the alphabetic text. It should be noted, however, that the searching may also be dynamically performed as text is entered. For example, a search may begin once the letter "B" is entered and the results of the search displayed adjacent to a search window. These results may then be subsequently narrowed with the input of a next character, e.g., "E", and displayed along with the search window. Thus, the user may receive immediate feedback regarding the search as the search is being entered.

[**0051**] In the illustrated example, the EPG module **144** locates content items and channels which are described in the EPG **140** utilizing a plurality of representations. The illustrated EPG **140** includes representations of a movie "A Beautiful Mind"**406**, a channel "206 BET"**408**, a television program "A Better Tomorrow"**410**, an infomercial "Be a Ballerina"**412**, a public service announcement "Be Cool, Play it Safe"**414**, and a streaming audio channel "922 BRAZ Brazilian Rhythms"**416**. Thus, in this example each of the representations includes at least one of the entered textual letters. Further, the EPG module **142** may order the representations as shown based on how much of the represented channel and/or content item corresponds to the search request. This is shown in **FIG. 4** through illustration of the streaming audio channel "922 BRAZ Brazilian Rhythms"**416** as last in the list of representations since the representation does not include the letter "E" as entered in the search window **402**. In another implementation, the EPG may automatically scroll to the representation which corresponds to the entered text in the text entry window **402**. For example, a user might not be able to remember a channel number, but does remember a call sign of the channel. Therefore, the user can take advantage of the adjacent search window **402** by entering all or part of the call sign of the channel. In response to the entry, the EPG may automatically scroll to a representation of the channel which corresponds to the entry. Thus, a user may interact with the EPG to quickly navigate even when using an input device that is configured for the 10' experience, such as a television remote control, or for other system having limited display space, such as a wireless phone. Although use of a search window **402** which is displayable concurrently with a plurality of representations of content items and/or channels has been described, a variety of other input techniques may be utilized to input the search request, another example of which may be found in relation to the following figure.

[**0052**] **FIG. 5** is a flow diagram depicting a procedure **500** in another exemplary implementation in which a search

request and a search result are formed through interaction by a user with an EPG. A client outputs an EPG **502** having a display of a plurality of channel representations **504-510** (block **512**). In the illustrated EPG **502**, the plurality of channel representations **504-510** are displayed in a column having a corresponding heading "Channel". Each of the channel representations **504-510** displays a call sign or title of the represented channel and a number of the represented channel. For instance, representation **504** includes the text "KQED 990", representation **506** includes the text "Holiday 991", representation **508** includes the text "HBO 992", and representation **510** includes the text "HBO Action 993". The EPG **502** is also illustrated as including a plurality of representations **512** of corresponding content items that are available via the respective channels.

[**0053**] The EPG may then receive an input from a user through interaction with the EPG (block **514**) which is illustrated as EPG **502'**. For example, the user may utilize a television remote control to select the representation **504'**. Representation **504'** is illustrated as a negative image of corresponding representation **504** of EPG **502** to depict the selection. The user may then enter alphabetic text while the representation **504'** is selected, such as through use of text entry keys on an input device.

[**0054**] As previously described, an EPG module may then be executed to search channel metadata based on the received input (block **516**). Based on the search, the EPG **502'** is configured to form EPG **502"** for display of at least one channel having channel metadata that corresponds to the received input (block **518**). For instance, the user may have entered the alphabetic characters "HB" while channel representation **504'** was selected. Therefore, the EPG module may interpret from this action that the user wishes to search for a particular channel and thus search channel metadata for one or more channels which satisfy the search request. Representations **508"**, **510"**, **520**, **522** of channels which satisfy the search request may then be output in the configured EGP **502"** for viewing by the user (block **524**). Although entry of alphabetic characters via a search window and through selection of a representation has been described, a wide variety of other input techniques and display techniques may be employed without departing from the spirit and scope thereof. For example, a user may enter a call sign of a channel number in the search window **402** of **FIG. 4** as previously described, which causes the channel lineup to automatically scroll to the channel having the entered call sign.

[**0055**] **FIG. 6** is a flow diagram depicting a procedure **600** in an exemplary implementation in which a result of a search of EPG data includes channels having a common owner. In the previous implementations, channel metadata was searched to locate channels which correspond to a search request. The channel metadata may also be searched to promote "branding", such as channels which share a common owner. For instance, an input may be received from a user through interaction with an EPG (block **602**) as previously described. A search may be performed utilizing channel metadata and based on the received input for channels owned by a common owner such that at least one of the channels corresponds to the received input (block **604**).

[**0056**] A search, for example, may be performed for "satellite news". As a result of the search, a news channel "Satellite News" may be located in channel metadata. The EPG module which performs the search may also locate other channels which are also owned by the owner of the "Satellite News" channel, such as "Satellite Headlines" Channel and a channel titled "In Their Own Words". Thus, the search result may include a channel which corresponds to the received input (e.g., "Satellite News" channel) as well as other channels which are commonly owned (e.g., "Satellite Headlines" channel and "In Their Own Words" channel). As before, the EPG may then be configured to display a representation of the at least one channel that corresponds to the search request and another representation of another channel that is commonly owned (block **606**). The configured EPG may then be output for viewing by a user (block **608**). In this way, the channel metadata may be utilized to promote brands (i.e., families) of channels that may be of interest to the user and are presented to the user without the user having to search for each commonly owned channel individually.

CONCLUSION

[**0057**] Although the invention has been described in language specific to structural features and/or methodological acts, it is to be understood that the invention defined in the appended claims is not necessarily limited to the specific features or acts described. Rather, the specific features and acts are disclosed as exemplary forms of implementing the claimed invention.

What is claimed is:

1. A method comprising:

searching channel metadata and content metadata and;

forming a result of the searching for output in conjunction with an electronic program guide (EPG).

2. A method as described in claim 1, wherein the searching is performed in response to a request formed through interaction by a user with the electronic program guide.

3. A method as described in claim 2, wherein:

the interaction includes entering one or more alphabetic characters into a search window in the EPG; and

the EPG includes a plurality of representations of content that are displayed concurrently with the search window.

4. A method as described in claim 1, wherein the searching and the forming are performed at a head end.

5. A method as described in claim 4, further comprising:

receiving a request via the electronic program guide at a client;

communicating the request from the client to a server; and

receiving the response at the client from the server.

6. A method as described in claim 1, wherein the searching and the forming are performed at a client that is configured to output the electronic program guide.

7. A method as described in claim 1, wherein the result includes a channel call sign.

8. A method as described in claim 1, wherein the result references at least one channel and at least one content item.

9. A method as described in claim 8, wherein the at least one content item is not available via the at least one channel.

10. A method as described in claim 1, wherein the channel metadata describes one or more characteristics of a plurality of channels, the one or more characteristics selected from the group consisting of:

call sign;

channel title;

genre;

channel owner; and

detailed channel description.

11. A method as described in claim 1, wherein the content metadata describes one or more characteristics of a plurality of content items, the one or more characteristics selected from the group consisting of:

content title;

detailed content description;

genre;

plot;

rating;

closed captioning support; and

detailed channel description.

12. One or more computer readable media comprising computer executable instructions that, when executed on a computer, direct the computer to perform the method as described in claim 1.

13. A method comprising:

receiving an alphabetic input entered via an electronic program guide (EPG) that describes one or more identifying characteristics of a channel;

searching EPG data for at least one channel that meets the identifying characteristics; and

outputting a result of the searching, via the EPG, that describes the at least one channel.

14. A method as described in claim 13, wherein the searching is performed on channel metadata that is included in the EPG data.

15. A method as described in claim 14, wherein the channel metadata is distinguishable from content metadata in the EPG data.

16. A method as described in claim 13, wherein the alphabetic input corresponds to at least a portion of a call sign of the channel.

17. A method as described in claim 13, wherein the alphabetic input corresponds to at least a portion of a descriptive name of the channel.

18. A method as described in claim 13, wherein the EPG includes a plurality of representations of content that are displayable concurrently with a search window.

19. A method as described in claim 13, wherein the receiving, the searching and the outputting are performed at a head end.

20. A method as described in claim 13, wherein the receiving, the searching and the outputting are performed at a client.

21. A method as described in claim 13, wherein the result references at least one channel and at least one content item.

22. One or more computer readable media comprising computer executable instructions that, when executed on a computer, direct the computer to perform the method as described in claim 13.

23. A method comprising:

receiving a search request from a user via an electronic program guide (EPG);

searching electronic program guide data to locate a plurality of channels having a common owner, wherein at least one said channel satisfies the search request; and

outputting one or more representations of the located plurality of channels in conjunction with the EPG.

24. A method as described in claim 23, wherein the receiving, the searching, and the outputting are performed at a head end.

25. A method as described in claim 23, wherein the receiving, the searching, and the outputting are performed at a client.

26. A method as described in claim 23, wherein at least one said representation is selectable by a user to navigate to a corresponding said content item.

27. One or more computer readable media comprising computer executable instructions that, when executed on a computer, direct the computer to perform the method as described in claim 23.

28. A method comprising:

displaying an electronic program guide having:

a plurality of representations of content items;

a plurality of representations of channels; and

a search window for locating at least one said representation of a channel or a content item that corresponds to a search request received from a user; and

updating the EPG for display of at least one said representation of the content items or at least one said representation of the channels which corresponds to an input entered by a user via the search window.

29. A method as described in claim 28, wherein the updating is performed without configuring the electronic program guide for display of a new page without the pluralities of representations.

30. A method as described in claim 28, wherein:

the updating is performed by scrolling the display of the electronic program guide such that at least one said representation of a corresponding said channel is displayed which corresponds to the input entered via the search window; and

the input includes alphabetic text.

31. One or more computer readable media comprising computer executable instructions that, when executed on a computer, direct the computer to perform the method as described in claim 28.

32. One or more computer readable media comprising computer executable instructions that, when executed on a computer, direct the computer to output an electronic program guide having a concurrent display of:

a plurality of representations of content items;

a plurality of representations of channels; and

a search window for locating at least one said channel or at least one said content item that corresponds to a search request received from a user.

33. One or more computer readable media as described in claim 32, wherein the electronic program guide is configured for output in a 10' experience.

34. One or more computer readable media as described in claim 32, wherein the electronic program guide is configured for output by a wireless phone.

35. One or more computer readable media as described in claim 32, wherein the plurality of representation of content items are provided by content metadata and the plurality of representations of channels are provided by channel metadata.

36. One or more computer readable media comprising computer executable instructions that, when executed on a computer, direct the computer to search channel metadata and content metadata included in electronic program guide data to locate a channel or a content item that corresponds to a search request received from a user.

37. One or more computer readable media as described in claim 36, wherein the search is performed in response to a request formed through interaction by a user with the electronic program guide.

38. One or more computer readable media as described in claim 37, wherein:

the interaction includes entering one or more alphabetic characters into a search window in the EPG; and

the EPG includes a plurality of representations of content that are concurrently displayable with the search window.

39. One or more computer readable media as described in claim 36, wherein:

a result of the search references the channel and the content item; and

the result is for output in conjunction with the EPG.

40. A computer comprising:

a processor; and

memory configured to maintain:

electronic program guide data having:

channel metadata that describes characteristics of a plurality of broadcast channels;

content metadata that describes characteristics of a plurality of content items; and

schedule data that describes when one or more said content items are available via a corresponding said broadcast channel; and

one or more modules that are executable on the processor to search the channel metadata to locate at least one said broadcast channel having a corresponding said characteristic that conforms to a search request entered by a user and form a result of the search that references the at least one said broadcast channel.

41. A computer as described in claim 40, further comprising a network transmitter configured to transmit the electronic program guide data to a client for output at the client.

42. A computer as described in claim 40, further comprising a network receiver configured to receive the electronic program guide data from over a network.

43. A computer as described in claim 40, wherein the characteristics described by the channel metadata are selected from the group consisting of:

content title;

detailed content description;

genre;

plot;

rating;

closed captioning support; and

detailed channel description.

44. A computer as described in claim 40, wherein the characteristics described by the content metadata are selected from the group consisting of:

call sign;

channel title;

genre;

channel owner; and

detailed channel description.

45. A computer as described in claim 40, wherein at least one said content item is a television program.

46. A computer as described in claim 40, wherein the one or more modules are further executable to generate an electronic program guide from the EPG data.

47. A computer as described in claim 40, wherein the search is performed in response to a request formed through interaction by a user with an electronic program guide.

48. A computer as described in claim 40, wherein the one or more modules are further executable to output the result of the search that references the at least one said broadcast channel for viewing by the user.

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